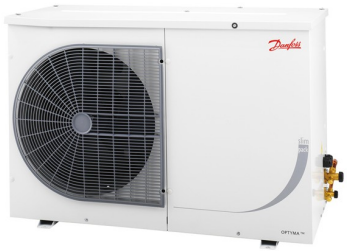


Danfoss Air Units User Guide

MAKING MODERN LIVING POSSIBLE
User Guide
Danfoss Air Units

www.heating.danfoss.com

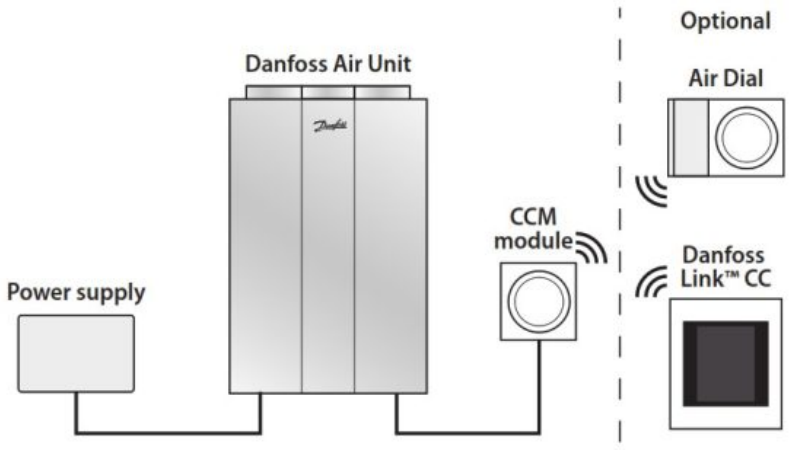
Contents

Safety Note

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.
Apart from the replacement of air filters and exterior cleaning of the system, any kind of maintenance will require the use of trained personnel.

Introduction

Congratulations on buying a Danfoss Air Unit
The Danfoss Air Units are among the most advanced, efficient, quiet and easy-to-use heat recovery ventilation systems.
By choosing either the Air Dial or the Danfoss Link™ Central Controller, you have the entire system under control, simply by turning and pushing one dial, while all necessary information is shown in the display.
With this User Guide we wish to take you through the few steps needed to operate and to maintain your system.



	All Danfoss Air units are Passive House certified by The Passive House Institute in Darmstadt.
	The Danfoss Air system uses Z-Wave wireless technology. Find more information on our website www.air.danfoss.com on the possibilities with Danfoss Air and Z-Wave technology.

Controlling the Air Unit with Air Dial

3.1 Main Menu

Main menu > Boost

The manual Boost command is used when larger air flow than normal is required, e.g. when cooking something with a strong odour or when someone is smoking. As default the Boost function makes the unit run at full speed for 3 hours, but these parameters can be changed in the Settings Menu.

The Autoboost function automatically increases the air flow, if humidity suddenly increases (e.g. caused by bathing or cooking). The Autoboost is active for 30 minutes, whereafter the system returns to the original air flow. The Autoboost function is switched on or off in the
Settings menu.

Main menu > Away

The Away command is used to reduce the air flow to a minimum, e.g. when you leave the house for a longer period of time. The unit will automatically return to normal operation, when the Away period is over. Parameters for the Away period are set in the Settings menu.

Note: If a heating surface is installed, it is turned off during the Away mode (saving energy).

Main menu > Bypass (not available for w¹ units)

Bypass is a cooling function, which uses the heat exchanger for lowering the supply air temperature. When the Bypass is open, outdoor air is led directly into the house.

Bypass can be activated in two ways:

1. Manually, by pressing the Bypass command. This will start the Bypass function for 3 hours (run time can be changed in the Settings menu). The Bypass will not be activated if the outdoor temperature is below +5 °C.
2. Automatically, if both outdoor air temperature and room temperature are above the level selected in the Settings menu. The Bypass automatically closes, when one of the temperatures is below the selected level. The automatic Bypass function is switched On or Off in the Settings menu.

Cooling Recovery function is an automatic system feature with Auto Bypass activated. If the outdoor temperature rises above the indoor temperature, the Danfoss Air unit can automatically close the Bypass function and use the heat exchanger as a cooling application to lower the supply temperature a few degrees. When Cooling Recovery is activated, the Bypass icon is On.

Main menu > Info

The info command shows a list with the present status of the unit: all measured temperatures, fan steps, relative humidity in the room and much more . . .

Main menu > Mode

With the Mode command you can choose how the Danfoss Air system is controlled:

Mode > Off

In the event of a toxic spill or fire outside the building, the unit can be turned off. After 24 hours, it starts up on step 1 of 10 to prevent moisture accumulation in the building. Thereafter the user can change the run mode if needed.

Mode > Manual

In Manual mode the air flow is kept constantly at the selected level (fan step 1 to 10).

Bypass and Autoboost are automatically controlled, but can be switched off in the Settings menu.

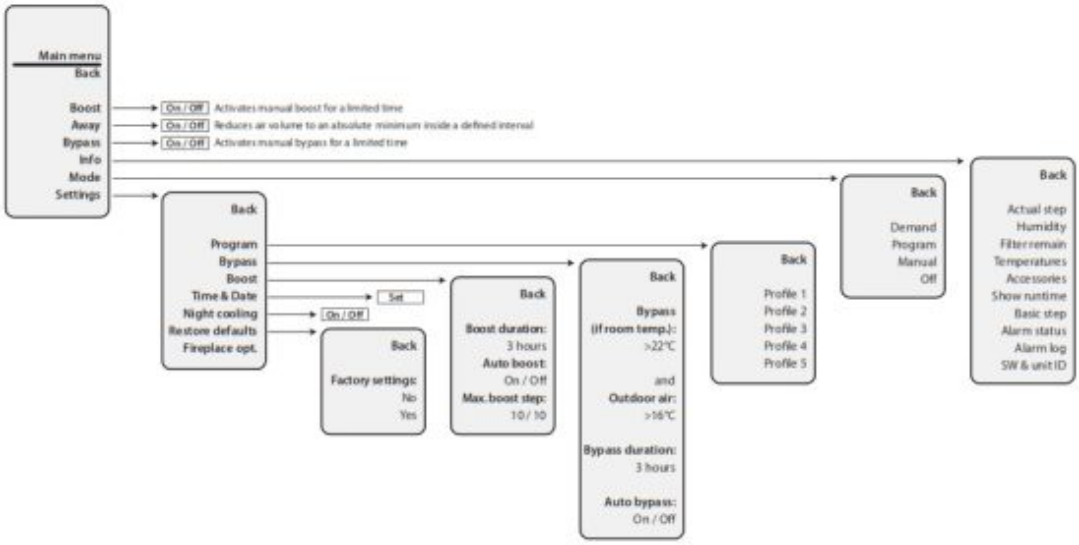
Mode > Demand
In Demand mode the built-in humidity sensor ensures that the air flow is automatically regulated:

- if the relative air humidity is too low inside the house, the system reduces the air flow.
- if the relative air humidity is too high, the system will work with a larger air flow.

Note: Outside the heating season the air flow will remain more or less constant at a rate equivalent to the basic step settings. This ensures maximum comfort at the time of year where heat loss is negligible.

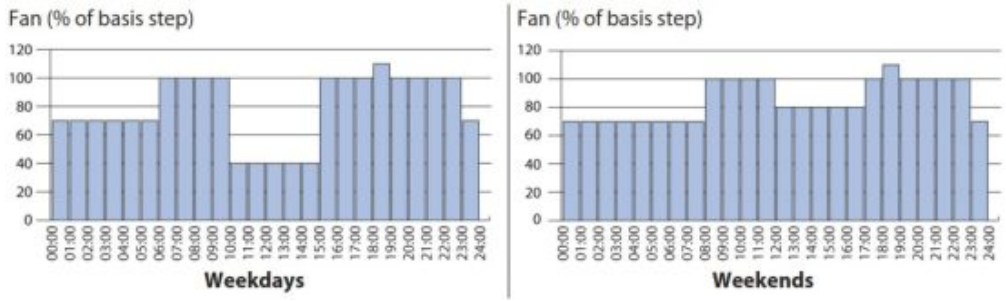
Mode > Programme
In Programme mode one of five pre-defined family profile is chosen. Based on the profile, ventilation rate is high during the periods when the house is occupied and less when the house is empty. Periods of increased air flow when bathing or cooking takes place are included in the programmes.
If none of the pre-defined profiles suits your requirements, you can download a pctool (freeware) with the option of creating your own user profile. Find the download and installation manual at **www.air.danfoss.com**.
If you choose Programme mode with no further settings, thee default profile is no. 1.

3.2 Menu Structure

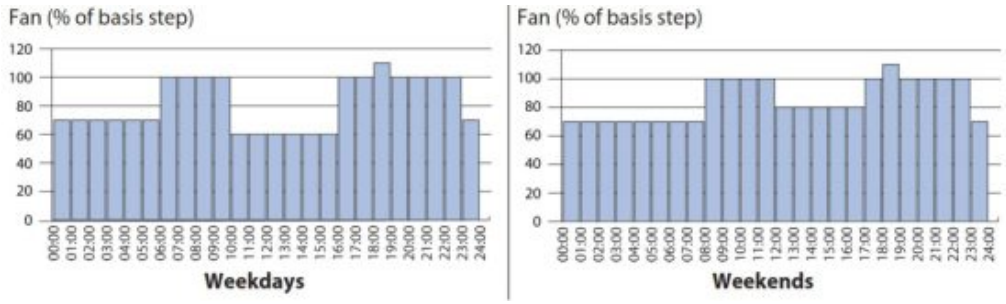


Note: The “Bypass” options and functions are not available for the “w1” unit.

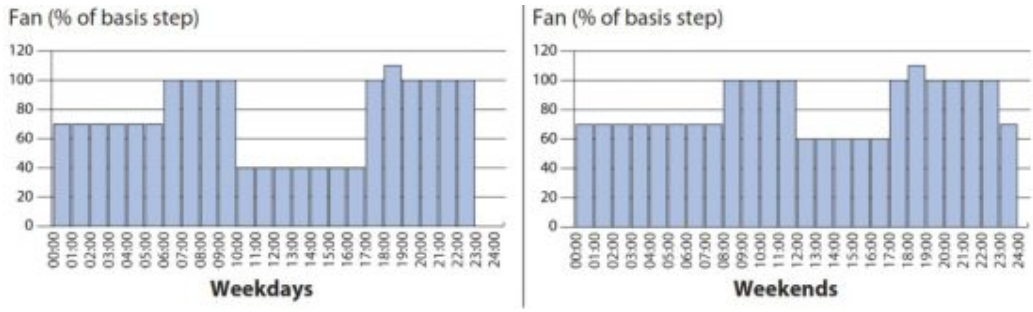
3.3 Settings
Main menu > Settings > Program > Profile 1-5
Before choosing a pre-defined program, the Program menu must be activated. Go to Main menu > Mode and choose Program. Then you can choose between 5 different pre-programmed profiles, as shown below Or create your own custom profile with Danfoss PC Tool, which can be downloaded from **www.air.danfoss.com** (freeware). A custom profile will be visible in the menu as Main menu > Settings > Program > Profile > User defined.
Profile 1: Family with children, both adults working normal hours.



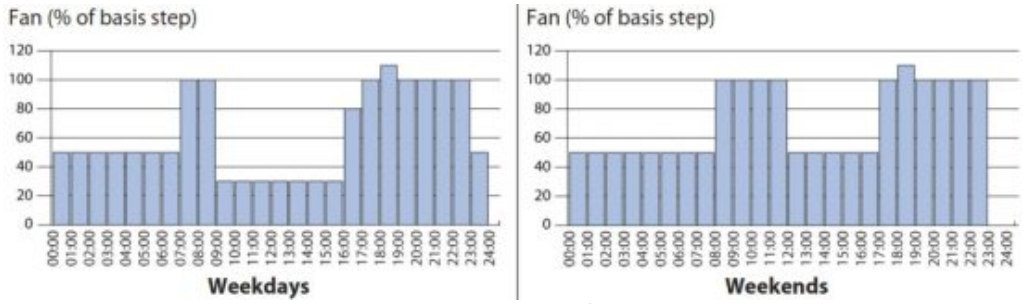
Profile 2: Family with children, one working adult, normal working hours, one adult at home during the day.



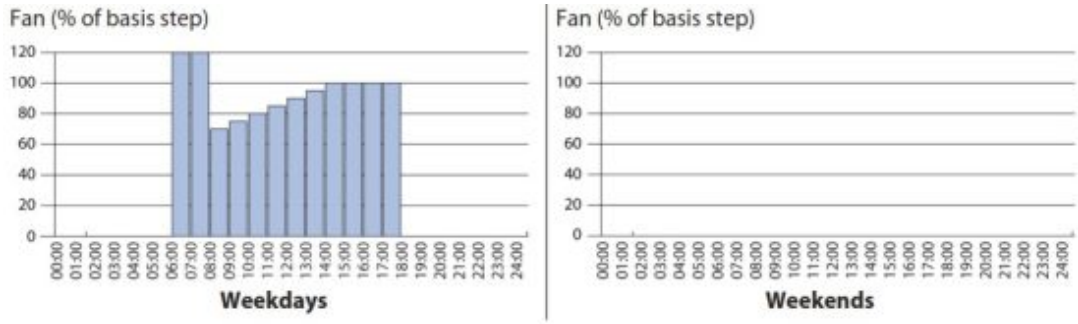
Profile 3: Couple without children, both working adults, normal working hours.



Profile 4: Single person (working adult), no one at home during work hours.



Profile 5: Small commercially used office or sales outlet area. Opening times 8 am-4 pm, closed at weekends.



Main menu > Settings > Bypass

Set parameters for the automatic Bypass (outdoor temperature and room temperature). The automatic Bypass function is activated, when both outdoor air temperature and room temperature are above the selected parameters. If only one of the parameters is present, the automatic Bypass is not activated.

To start the Bypass manually, press the Bypass command. The Bypass is active in the time period chosen in **Main menu > Settings > Bypass > Timer** (default setting is 3 hours).

The Bypass will not be activated if the outdoor temperature is below +5 °C.

Note: Bypass options and functions are not available for the “w1” unit.

Main menu > Settings > Boost

Customise the Boost function to match individual requirements:

- Set timer for manual Boost (default is 3 hours)
- Turn Autoboost On or Off. When Autoboost is On, it is active in all modes.
- Reduce maximum Boost step, if the default maximum step (10 = 100% fan speed) is too powerful for the system.

Main menu > Settings > Time & date
Set the actual time and date of the system.

Main menu > Settings > Night cooling
Turns the Night Cooling function On or Off (default setting is Off). With Night Cooling on the system automatically detects if it was a warm day (the outdoor air temperature is over 20 °C at noon and at 4 PM) . If so, the fresh, cool outdoor air is led directly to the supply air from midnight until 6 AM.
The Night cooling function automatically stops if the outdoor air temperature falls below 10 °C or if the extract air temperature falls below 18 °C.
Note: Night Cooling is not available for the “w1” unit.

Main menu > Settings > Restore default
Restore all user settings to factory default values.

Main menu > Settings > Fireplace opt.
Turns the Fireplace opt. On or Off. If a fireplace is present, the Fireplace opt. can prevent the creation of unwanted negative pressure, which can cause severe problems to humans and animals. With the Fireplace opt. On the Danfoss Air system monitors the temperature values continuously, preventing the unit from entering the automatic Defrost mode (in Defrost mode the unit de-ices the heat exchanger in periods with very low outdoor temperatures). If the temperature ratios demands a Defrost mode, the unit’s automatic safety function immediately stops both fans for 30 minutes, then slowly starts again and checks the temperatures. If temperatures are OK the unit returns to normal operation, if temperatures are not OK the unit re-enters the safety function and stops for an additional 30 minutes.
To avoid problems with negative pressure Danfoss recommends to install a pre-heating surface with the Danfoss Air unit (see Heating Surfaces).

Adjustment of the Danfoss Air unit
When you are going to commission your unit for the first time or if you want to install a fireplace after some time, we recommend you to adjust both supply and extract air to be equal. Hereby you secure a “balanced” airflow.
A too large supply air rate can cause an overpressure in the building. This must be avoided at any means due to an unwanted accumulation of humidity in the building.

Important!
A big cooker hood with direct exhaust, can challenge the Air Unit during the winter period.
If you experience that the air flow is cold, the reason might be that the cooker hood engine is stronger than the Air Unit engine. The Air Unit experiences a negative pressure and compensates through supply and extract.
Low outdoor temperatures affect the heat exchanger and when the temperature sensor detects that, the Defrost mode is activated.
If the temperature ratios demands a Defrost mode, the unit’s automatic safety function might stop both fans for 30 minutes, then slowly starts again and check the temperatures. If the temperatures are OK, the unit returns to normal operation. If the temperatures are not OK, the unit re-enters the safety function and stops for additional 30 minutes.
To avoid problems with negative pressure Danfoss recommends to:

1. Install a damper in the kitchen.
2. Open a window when using the cooker hood.

Note: If you experience any problems with negative pressure, contact your installer and ask if a damper is

installed.
Negative pressure is often a challenge in new-build and energy renovated houses.

Legislative conditions

The installation of a Danfoss Air system must always comply with all national, regional or local legislations and rules.

3.4 Replacing Air Dial Batteries

When the Air Dial needs a new set of batteries it is indicated by an alarm sound.
Lift the Air Dial off the wall bracket and replace with four AAA batteries.

Controlling the Air Unit with Danfoss Link™ Central Controller

If you control the air unit with Danfoss Link™ CC, you can find general information and instructions for air units in a Danfoss One® system, by compiling a user guide at **www.link.danfoss.com**.

Replacing Filters

Danfoss Air units are designed for an absolute minimum of maintenance. Maintenance is limited to one or two filter replacements a year, depending on air volume and local air pollution level.
In industrial areas and in areas with a high concentration of pollen in the outdoor air the filters will be clogged faster than in a typical suburban environment.
Danfoss Air units are fitted with original filters that are designed to protect the unit and the indoor climate.
These filters have been tested and validated, so that they also protect the internal components like heat exchanger and fans. If other filters than the original spare parts are used, Danfoss cannot guarantee the full quality or lifetime for the internal components.
Standard filters and optional pollen filters (F7 class) can be purchased from your installer.

Replace filters when Air Dial gives the filter alarm (alarm sound from and message in display):

1. Remove the front panel (no tools needed).
2. Pull out the filters and inspect them visually.
3. If the filter is only lightly fouled/discoloured, you might try to clean it, using a vacuum cleaner with a brush. Normally this will not be worthwhile nor recommended.
4. Fit new filters* and reattach the foam covers.

5. Press the filter reset button on the front of the unit.

* If you have bought a special pollen filter, it should be fitted in the filter slot to the right (on all models), as this is filtering the outdoor air.

Standard filter set
The standard filter set are G4 class for both supply and discharge air, which provide basic filtration of particles larger than 10 µm.

	G4/G4 standard filter set for Danfoss Air Unit w¹ G4/G4 standard filter set for Danfoss Air Unit w² G4/G4 standard filter set for Danfoss Air Unit a² G4/G4 standard filter set for Danfoss Air Unit a³	**Order no.** 089F0238 089F0239 089F0236 089F0237

Pollen filter set
If allergies are present in your family, choose a pollen filter set with F7 class filter for supply air to effectively filter out pollen.

	G4/F7 pollen filter set for Danfoss Air Unit w¹ G4/F7 pollen filter set for Danfoss Air Unit w² G4/F7 pollen filter set for Danfoss Air Unit a² G4/F7 pollen filter set for Danfoss Air Unit a³	**Order no.** 089F0242 089F0243 089F0240 089F0241

Cleaning the Air Unit

The inside of the Danfoss air unit should be cleaned every other year.

1. Disconnect power and remove the front panel.

2. Remove the six screws holding the three metal rails (using the correct size torx key).

3. Remove the front foam panel to get access to the parts inside the unit.

4. Pull the thick round seal over the heat exchanger out sideways. When remounting the exchanger, the round seal should be inserted last. This is best done by ‘locking in the two ends’ first and then pushing the rest of the seal into place.

5. The heat exchanger can now be lifted/pulled carefully out of the core.

6. Pour a mild solution of regular dishwashing soap through the four open sides of the heat exchanger.
   Let it soak for 5-10 minutes before rinsing under running water. Dry the exterior of the heat exchanger, and gently slide the heat exchanger back into the unit.
   Clean interior surfaces of the unit with a wet sponge or cloth (use a mild soapy solution).
   Under no circumstances use solvents for cleaning the foam parts, as solvents can dissolve the special foam material.
   Avoid spraying water onto the main circuit board. If water is spilled onto the board, tap it lightly with a dry cloth and leave to air dry for min. 24 hours before reconnecting the power.

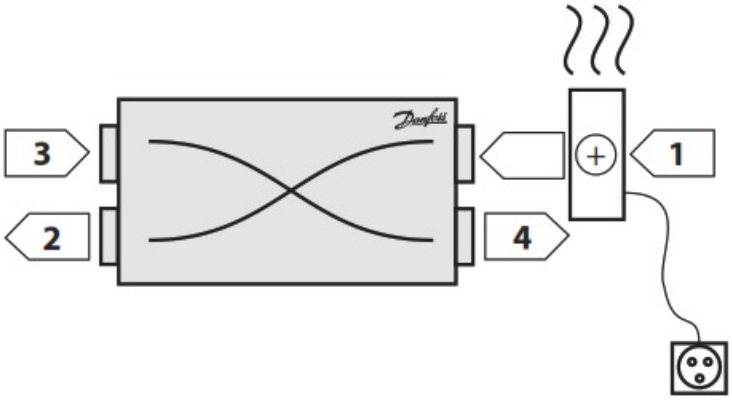
Assemble the unit in reverse order:

1. Install the foam front panel.
2. secure the panel with the three metal rails.
3. Tighten torx screws.
4. Reinstall the front panel.
   You are now ready for another two years of trouble-free operation.

Heating Surfaces

A pre-heating surface gives a large range of benefits for the Danfoss Air system and the indoor climate in general. Danfoss always recommends to install a pre-heating surface with the Danfoss Air unit.
With a pre-heating surface the system is protected against entering the automatic Defrost mode, which can cause negative pressure in the building – especially if a fireplace is present.

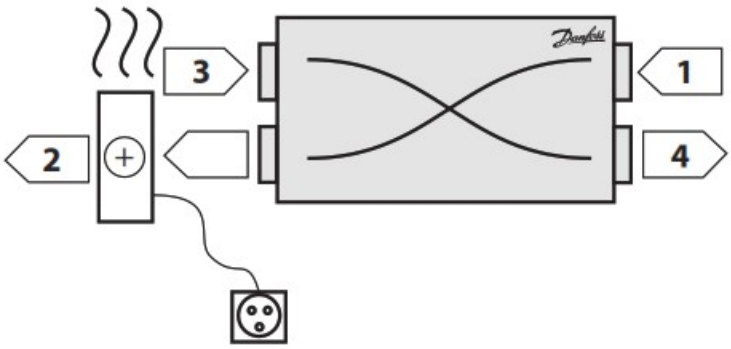
Preheating surface, electric



1. Outdoor air 2. Supply	3. Extract 4. Exhaust

The electric preheating surface is used to protect the system against icing up at low outdoor temperatures.
Before the outside air reaches the system, it is heated up from the current outside temperature to 0°C (which makes frost formation in the exchanger impossible). This solution ensures a permanent balance between the supply and extraction air. Adjustment is 100% stepless to ensure the lowest possible power consumption during operation. No settings are required on an electric preheating surface.

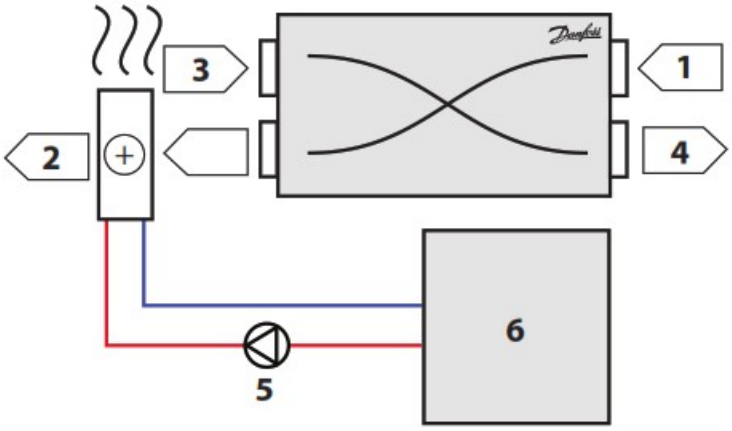
Afterheating surface, electric



1. Outdoor air 2. Supply	3. Extract 4. Exhaust

The electric after heating surface is used to ensure a minimum supply temperature before the air is blown into the room. The ventilation system will usually heat the outside air up to a temperature that is very close to room temperature so the electric after heating surface is only used to give the supply temperature a little lift.
Adjustment is 100% stepless to ensure the lowest possible power consumption during operation.
The required supply temperature can be set from the Air Dial in **Main menu > Settings > Temperature > Supply.**

After heating surface, water-based

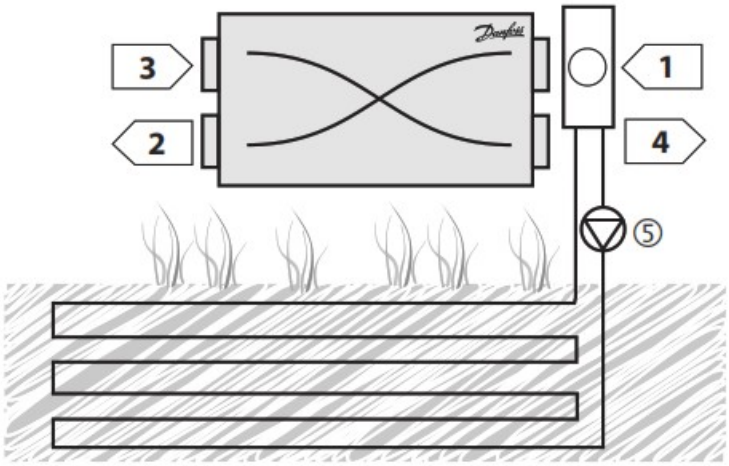


1. Outdoor air 2. Supply 3. Extract	4. Exhaust 5. Pump 6. Central heating

The water-based afterheating surface is (most often) used to ensure a minimum supply temperature before the air is blown into the room. The ventilation system will usually heat the outdoor air up to a temperature that is close to room temperature so the water-based afterheating surface is only used to give the supply temperature a little lift.
100% stepless control is carried out via the built-in motor valve.
The required supply temperature can be set from the Air Dial in Main menu > Settings > Temperature > Supply.
The afterheating surface can also in special cases be used as total heating in passive or 0 energy houses if all

parts of the system have been dimensioned for it. If your system was configured for air heating, the room temperature can be set in the main menu.

Preheating/cooling surface, geothermal



1. Outdoor air 2. Supply 3. Extract	4. Exhaust 5. Pump

The geothermal surface is able either to preheat or precool the outside air depending on the season. The control automatically determines what is required and controls the surface in and out of operation as required.
The geothermal surface is provided with ‘anti-freeze’ (brine) which is circulated in a buried ground pipe using a circulation pump. This means that it is ‘free renewable energy’ that can be used with a clean conscience.
In the winter, preheat can be used to prevent the system from going into frost protection mode and in the summer it can provide pleasant additional cooling by cooling the air before it reaches the system. When the geothermal surface is cooling, the ventilation system’s bypass of course opens automatically.

PC Controls

Control your DANFOSS AIR system from your PC screen via Ethernet.

- Make customised weekly programmes with the user-friendly week programme editor.
- Monitors and displays all temperatures and relative humidity in the house, in a single screenshot
- See trend curves for the last 14 days, all relevant sensors are logged hourly
- Easy access to advanced settings, all functions are described in a short and easy to understand text.

Download Danfoss Air PC Tool from www.air.danfoss.com – it is free of charge!
Note: There are limited options in the Danfoss Air PC Tool, when using Danfoss Link™ CC.

Troubleshooting

Error	Cause	Solution
Alarm: Filter erro r	Air filters are dirty.	Exchange air filters.
Alarm: Battery lo w	Battery voltage in Air Dial is too low.	Replace batteries (4 x AAA) in Air Dial.

Alarm: No connection to CCM	Communication between Air Dial and CCM module has failed, typically caused by an obstacle between Air Dial and CCM module, e.g. steel piping, other steel ob- jects, insulation material clad with aluminum foil, etc. Another cause can be other wireless appliances that does not conform to wireless standards (radio noise).	If an obstacle has been identified, move it. If this is not possible, move CCM module to a better location with a free 'line of sight'. If the error occurs due to other wireless appliances in your house, try switching these off in turn to identify the faulty de-vice. If none of the above helps, please contact your installer.
Alarm: No connection via modbus	Cable between CCM module and unit is unplugged or defective.	Check cable and reconnect if necessary. If cable is connected, but error still occurs -contact installer.
Alarm: Room air too cold	Central heating system is not supplying heat. Room temperature is dropping, so the unit turn off to reduce involuntary heat loss. Alarm active if Air Dial measures a room temperature below +10°C.	Check if heating system is functional. If the problem can not be solved, contact plumber/installer. When error has been remedied, shut down and restart ventilation system to resume normal operation. Power can be disconnected by pulling power cable from system.
Alarm: Fire	One of four temperature sensors in Danfoss Air unit or temperature sensor in Air Dial remote control has detected a temperature higher than +70°C. Unit turns off until all sensors indicate < +70°C.	Examine all rooms, leave the house. When error has been remedied, shut down and restart ventilation system to resume normal operation. Power can be disconnected by pulling power cable from system.
Alarm: Sensor error	Temperature sensor in Danfoss Air unit or Air Dial is defective.	Contact installer. System continues to run, but with limited functionality.
Alarm: Supply air too cold	The supply air sensor has detected a sup- ply temperature below +5°C and the unit automatically stops to prevent unwanted cooling of the building. This detection is caused by negative pressure due to an external influence, e.g. a cooker hood with direct exhaust.	Power cycle the unit to start it again. Investigate which household appliance is the cause of the alarm. Danfoss recommends installing a pre-heating surface or/and using household components with air recirculation. For further details contact your installer.
Alarm: Fireplace stop activated	With Fireplace opt. activated: the unit has stopped due to a risk of a negative pressure.	The unit stops for 30 minutes, then all temperatures are checked. If temperatures are OK the units starts again. If not the unit will cycle this process continuously until all temperatures are in the right range. A permanent solution could be installing a pre-heating surface. Contact your installer for further details.
Abnormally large negative pressure inside the house, doors binding	Discharge air flow is larger than supply air flow. Either balancing was not carried out correctly during set-up of the system or unit is in extreme defrost conditions (can occur at outdoor temperatures < -12°C).	Imbalance of flow should be 4-10% in fa-your of discharge air, but if problems with doors binding is permanent, contact installer. If problems only arises during extreme winter condition, it is due to the integrated defrost controller that reduces the supply air (hence not a defect, but an expected, and very rare occurrence).

Condensation in window frames	Air exchange is too low. Condensation occurs when humidity is high and surface temperatures are low, typically in bath- rooms or utility rooms, where clothes are drip drying (some condensation in bathrooms following a shower is normal, but should disappear within half an hour).	Increase fan step (Manual mode) or change to Demand mode or Programme mode. Set Autoboost On.
House temperatures are too high	House thermostats are set too high.	Turn down thermostats.
	Bypass is disabled on ventilation system.	Enable Bypass in Main menu > Bypass > Auto bypass.
Noise from unit	a-type unit: vibration noise may occur if unit is mounted directly onto joists. Unit should be mounted on a suitable platform.	Check that unit is mounted on platform, according to installation manual.
	w-type unit: vibration noise may occur if rubber spacers are not fitted between unit and wall and/or if silicone strip is not fitted onto wall bracket.	Check that rubber spacers and silicone strip are fitted, according to installation manual.
	Defective fan bearings will produce a ‘grinding noise’.	If fan ball bearing is suspected to be defective, contact installer.
Noise from Air valves	Air flow is too high.	Noise is not a problem in a correctly sized and commissioned system. However, if air valves are closed (e.g. during cleaning), a hissing noise may occur.
	Pressure is too high over valve.	
	No silencer is fitted to main duct.	
Frost icon in display 	The system is in defrost mode, because low outdoor temperatures entail a risk of ice forming in the heat exchanger.	This is not an error, but a standard mode. The function stops automatically when the outdoor temperature rises.

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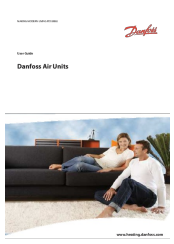
VUEWA802
Produced by Danfoss Heating Solutions © 08/2013
The English language is used for the original instructions.
Other languages are a translation of the original instructions.

(Directive 2006/42/EC)

Documents / Resources

	Danfoss Danfoss Air Units [pdf] User Guide Danfoss Air Units, Air Units, Units

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- User Manual